

1. Solve the modeling problem below, if possible.

*A new virus is spreading throughout the world. There were initially 8 many cases reported, but the number of confirmed cases has doubled every 1 days. How long will it be until there are at least 100000 confirmed cases?*

- A. About 14 days
  - B. About 4 days
  - C. About 5 days
  - D. About 10 days
  - E. There is not enough information to solve the problem.
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2. For the scenario below, find the variation constant  $k$  of the model (if possible).

*In an alternative galaxy, the cube of the time,  $T$  (Earth years), required for a planet to orbit Sun  $\chi$  decreases as the square of the distance,  $d$  (AUs), that the planet is from Sun  $\chi$  decreases. For example, when Ea's average distance from Sun  $\chi$  is 10, it takes 67 Earth days to complete an orbit.*

- A.  $k = 1.284$
  - B.  $k = 30076300.000$
  - C.  $k = 4.028$
  - D.  $k = 3007.630$
  - E. Unable to compute the constant based on the information given.
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3. For the scenario below, find the variation constant  $k$  of the model (if possible).

*In an alternative galaxy, the square of the time,  $T$  (Earth years), required for a planet to orbit Sun  $\chi$  decreases as the cube of the distance,  $d$  (AUs), that the planet is from Sun  $\chi$  decreases. For*

*example, when Ea's average distance from Sun  $\chi$  is 10, it takes 91 Earth days to complete an orbit.*

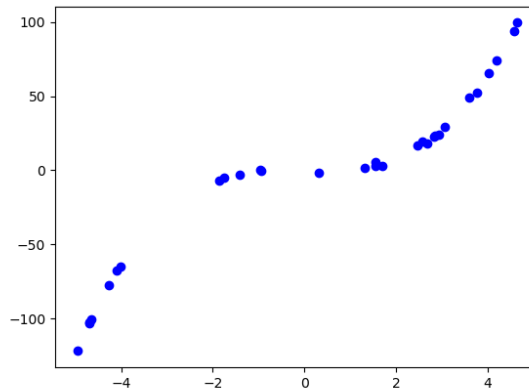
- A.  $k = 8.281$
- B.  $k = 4.428$
- C.  $k = 4.028$
- D.  $k = 8281000.000$
- E. Unable to compute the constant based on the information given.

4. Solve the modeling problem below, if possible.

*In CHM2045L, Brittany created a 25 liter 18 percent solution of chemical  $\chi$  using two different solution percentages of chemical  $\chi$ . When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 9 percent and 21 percent solutions, what was the amount she used of the 21 percent solution?*

- A. 9.79liters
- B. 18.75liters
- C. 6.25liters
- D. 12.50liters
- E. There is not enough information to solve the problem.

5. Determine the appropriate model for the graph of points below.



- A. Exponential model
- B. Logarithmic model
- C. Linear model
- D. Non-linear Power model
- E. None of the above

6. For the scenario below, use the model for the volume of a cylinder as  $V = \pi r^2 h$ .

*Pringles wants to add 45 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?*

- A. About 13 percent
- B. About 22 percent
- C. About 20 percent
- D. About 15 percent
- E. None of the above

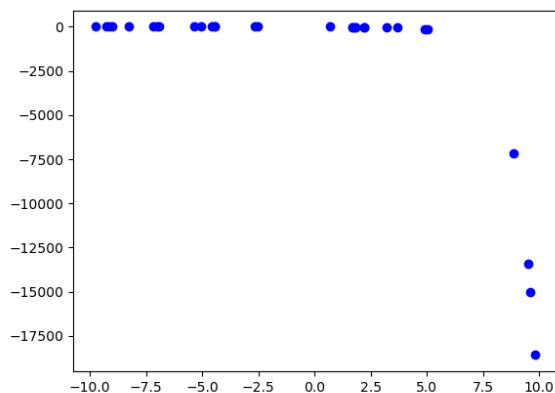
7. For the scenario below, use the model for the volume of a cylinder as  $V = \pi r^2 h$ .

*Pringles wants to add 49 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?*

- A. About 22 percent
- B. About 14 percent
- C. About 16 percent
- D. About 24 percent
- E. None of the above

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8. Determine the appropriate model for the graph of points below.



- A. Exponential model
- B. Logarithmic model
- C. Linear model
- D. Non-linear Power model
- E. None of the above

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9. Solve the modeling problem below, if possible.

*A new virus is spreading throughout the world. There were initially 6*

*many cases reported, but the number of confirmed cases has tripled every 5 days. How long will it be until there are at least 1000000 confirmed cases?*

- A. About 55 days
- B. About 25 days
- C. About 24 days
- D. About 61 days
- E. There is not enough information to solve the problem.

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10. Solve the modeling problem below, if possible.

*In CHM2045L, Brittany created a 15 liter 10 percent solution of chemical  $\chi$  using two different solution percentages of chemical  $\chi$ . When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 7 percent and 18 percent solutions, what was the amount she used of the 18 percent solution?*

- A. 5.09liters
  - B. 7.50liters
  - C. 10.91liters
  - D. 4.09liters
  - E. There is not enough information to solve the problem.
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